Volunteer Lake Assessment Program Individual Lake Reports

RUST POND, WOLFEBORO, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,651	**Max. Depth (m):**	12.2	**Flushing Rate (yr^{1})**	0.6
Surface Area (Ac.):	210	**Mean Depth (m):**	7.4	**P Retention Coef:**	0.68
Shore Length (m):	4,800	**Volume (m^{3}):**	6,310,500	**Elevation (ft):**	579

TROPHIC CLASSIFICATION

Year	Trophic class
1981	MESOTROPHIC
2000	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

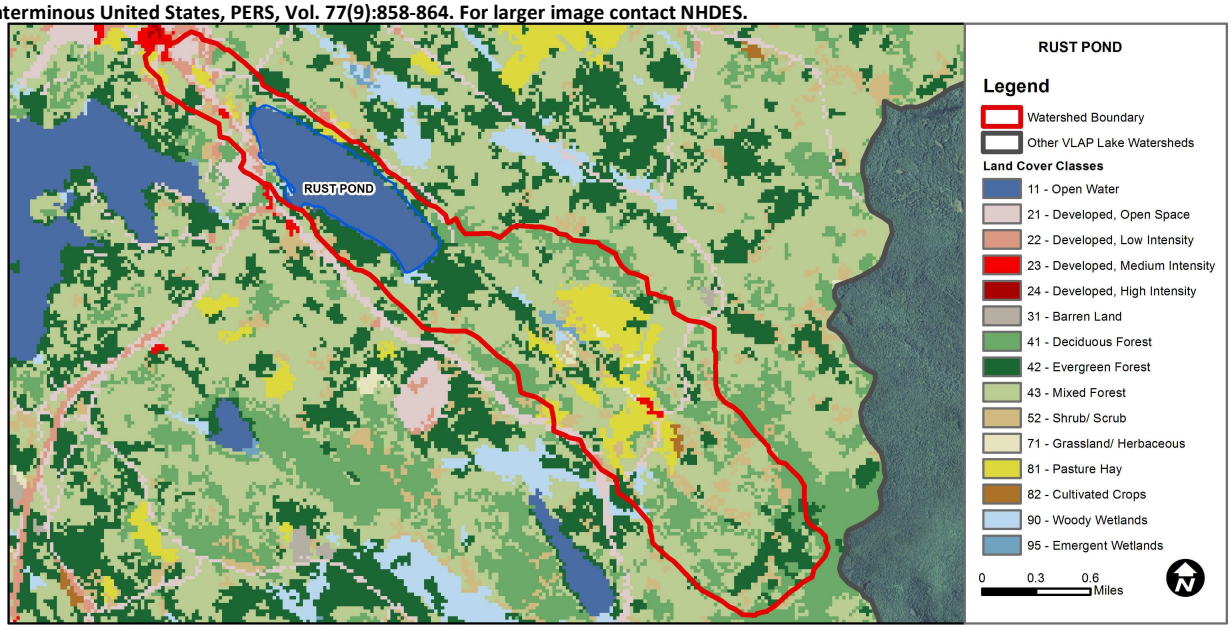
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

RUST POND - WOLFEBORO CAMP SCHOOL BEACH	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	12.4	Barren Land	0	Grassland/Herbaceous	0.5
Developed-Open Space	3.73	Deciduous Forest	15.42	Pasture Hay	9.68
Developed-Low Intensity	1.45	Evergreen Forest	14.69	Cultivated Crops	0.24
Developed-Medium Intensity	0.48	Mixed Forest	34.07	Woody Wetlands	0.99
Developed-High Intensity	0	Shrub-Scrub	6.04	Emergent Wetlands	0.38

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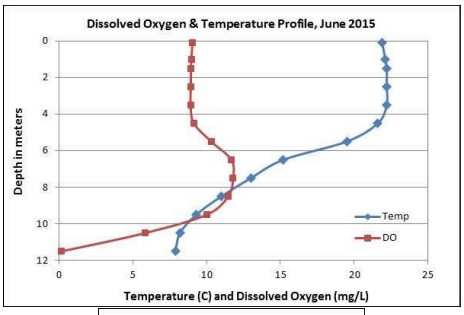
Rust Pond, Wolfeboro

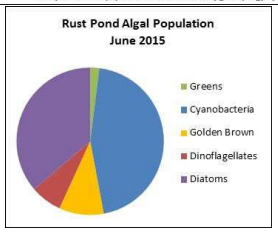
2015 Data Summary

Recommended Actions: The significantly worsening deep spot conductivity levels are concerning. North End Inlet clearly is a source of conductivity and chloride from winter road salt application on roadways, parking lots and driveways. Educate and encourage local road agents and winter maintenance companies to obtain a Voluntary NH Salt Applicator license through UNH's Technology Transfer Center's Green SnowPro certification program. Educate Kingswood Regional Middle and High Schools maintenance staff on best practices for salt application on parking lots and walkways at the schools. This could help reduce chloride levels and therefore conductivity in the Inlet and the pond. Sampling was conducted during or after significant rain events in 2015. Turbidity was slightly elevated in North End Inlet and turbidity and phosphorus were slightly elevated in Perry Brook. Sediment plumes are visible where these tributaries enter the pond. Both are fed by wetland systems which can act as sediment traps but also release sediment and phosphorus during high volume storm events. This release of fine sediments and water rich in organic acids and color may be contributing to the decline of pond transparency. This highlights the importance of managing stormwater runoff from other watershed properties to minimize pollutant loads during storm events. The improving deep spot phosphorus levels are a great sign; keep up the great work!

Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels decreased from June to July and then increased slightly from July to August. Average chlorophyll levels remained low and much less than the state median. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot conductivity increased sharply in 2015 potentially due to the more severe winter weather and spring runoff associated with snow melt. Average deep spot conductivity was greater than the state median and historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity since monitoring began. Conductivity has also significantly increased in the metalimnion (middle water layer) and hypolimnion (lower water layer). Epilimnetic chloride levels were only slightly greater than the state median however North End Inlet conductivity and chloride levels continue to be elevated and much greater than the rest of the pond stations.
- **Total Phosphorus:** Epilimnetic phosphorus decreased slightly from June to July and remained stable into August. Average phosphorus levels were low and much less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic and metalimnetic phosphorus since monitoring began and we hope to see this continue! Metalimnetic and hypolimnetic phosphorus levels decreased from June to August and were within a low range. North End Inlet phosphorus levels were within an average range and remained relatively stable from July to August. Outlet phosphorus levels were low and Perry Brook phosphorus levels were slightly elevated on each sampling event and the turbidity of those samples was also slightly elevated.
- **Transparency:** Transparency was lower in June, increased (improved) in July and then decreased slightly in August. Average transparency decreased slightly from 2014 but was much better than the state median. However, historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began. Transparency measured with the viewscope (VS) was much better than that measured without and likely a better representation of conditions.
- **Turbidity:** Deep spot and Outlet turbidities were generally low to average from June to August. North End Inlet turbidity was elevated in June following a significant storm event and slightly elevated in July and August following storm events. Perry Brook turbidity was slightly elevated on each sampling.
- **pH:** Epilimnetic pH values were invalidated due to a meter error and we apologize for the inconvenience. Historical trend analysis through 2014 indicates stable epilimnetic pH. Metalimnetic, hypolimnetic, North End Inlet, Outlet, and Perry Brook pH levels were within the desirable range 6.5-8.0 units.





NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

Station Name	Table 1. 2015 Average Water Quality Data for RUST POND								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	14.9	2.05	11	87.5	6	4.71	5.46	0.92	
Metalimnion				88.5	8			1.05	7.31
Hypolimnion				91.3	10			1.18	6.91
North End Inlet			84	409.3	17			11.06	6.90
Outlet				88.4	7			1.61	7.25
Perry Brook			4	73.2	20			2.96	6.92

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Worsening	Data significantly increasing.	Chlorophyll-a	Stable	Trend not significant; data show low variability.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.